

## M02M.3—The Coriolis Effect

### Problem

A particle is dropped vertically in the Earth's gravitational field at latitude  $\lambda$ . Assume it feels an air drag  $F = kv^2$ . Due to the Coriolis effect, it will undergo a horizontal deflection.

- a) Initially neglect the Earth's rotation. Find an explicit equation for the vertical velocity.
- b) Working at leading order in the Earth's angular velocity  $\omega$ , and using the result you just derived, find the horizontal velocity as a function of time.
- c) What is the velocity at  $t \gg \sqrt{\frac{m}{gk}}$ ?